MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY,
U. S. DEPARTMENT OF AGRICULTURE.

Number 24. April, 1916.

W. F. FISKE RETURNS TO ENGLAND.

W. F. Fiske, who has been in British East Africa for some time in the investigation of the bionomics of Tsetse flies for the Imperial Bureau of Entomology, has returned to England by way of Khartum and Cairo.

VISITING SCIENTISTS DURING APRIL.

Dr. W. M. Wheeler of the Bussey Institution, in attendance at the meeting of the National Academy at Washington April 17 - 19, spent part of a day in the U. S. National Museum studying the collection of ants left by the late Theo. Pergande. Mr. Pergande's entire collection has been given to the Museum by his daughter. The ants are in good condition, but many of the insects of the other orders have been uncared for in late years and badly eaten by Dermestids.

Prof. M. Caullery, successor to the late Alfred Giard as Director of the Laboratory for the Study of the Evolution of Organized Beings in Paris, and now Exchange Lecturer at Harvard, visited the Bureau on the 19th of April. He wished very much to make a thorough examination of the organization, since he had heard so much enthusiastic praise from Dr. Paul Marchal who visited this country in 1913.

Dr. Frank R. Lillie, Professor of Zoology and Embryology at the University of Chicago, visited the Bureau on the 20th for two or three hours, and said that the university men and the Government men should get together more than they have in the past and make greater efforts to understand each other's work.

A DANGEROUS IMPORTATION.

During the month it transpired that the British Steamship Appam, brought to Norfolk, Va., as a German prize of war had about two hundred tons of cotton seed from West Africa as a part of its cargo. Messrs. Marlatt and Hunter visited Norfolk and Newport News in connection with the disposition of this seed which was found to be infested by the pink bollworm (Gelechia gossypiella). A provisional sale of the seed by the Admiralty Court to an oil-mill in North Carolina was set aside when the danger was explained. Arrangements were immediately made for placing the entire lot in sulphuric-acid vats as a preliminary to the conversion of the seed into fertilizer. As an additional precaution the holds of the Appam were fumigated with hydrocyanic-acid gas under the supervision of Mr. Morrison.

NATIONAL COMMITTE ON MALARIA.

Following the adoption of a resolution by the second Pan American Scientific Congress to the effect that all American countries should inaugurate plans for malaria eradication and control, a National committee on the study and prevention of malaria throughout the United States has been organized. The main work outlined

consists of - (1) Educational propaganda; (2) Scientific research divided into medical, sanitary and statistical groups; (3) General scientific research along the lines of inquiry followed by the London and Liverpool schools of Tropical Medicine, and the Malaria Committee of Bombay. The National committee consists of twenty-two members, among them Dr. L. O. Howard and Mr. W. D. Hunter. The first meeting of the Committee will be in connection with the annual meeting of the American Medical Association in June.

CHANGES IN DESIGNATION IN THE BUREAU OF ENTOMOLOGY.

The following changes in titles, rendering the designations of the heads of offices, more compatible with their specialized lines of work, are herewith announced:-

C. L. Marlatt, Entomologist and Assistant Chief of Bureau.
W. D. Hunter, Entomologist in Charge Southern Field Crop Insect Investigations.
A. L. Quaintance, Entomologist in Charge Deciduous Fruit Insect Investigations.
F. H. Chittenden, Entomologist in Charge Truck Crop and Stored Product Insect Investigations.
A. F. Burgess, Entomologist in Charge Preventing Spread of Moths.
E. F. Phillips, Apiculturist.
L. H. Worthley, Agent, Preventing Spread of Moths.
G. F. White, Expert, Apicultural Investigations.
E. A. Back, Entomologist, Mediterranean and Other Fruit-Fly Investigations.
W. D. Pierce, Entomologist, Southern Field Crop Insect Investigations.
N. E. McIndoo, Insect Physiologist, Deciduous Fruit Insect Investigations.
A. T. Speare, Mycoentomologist, Deciduous Fruit Insect Investigations.

EXCEPTIONS TO THE CURRENT FISCAL REGULATIONS.

Particular attention of field employees is directed to Memorandums No. 162 and 163 of the Office of the Secretary, amending the current fiscal regulations.

The following changes have been noted and are herewith presented in order to minimize errors which may arise through misinterpretation:

PAR. 44.

Change the following --

Office of Experiment Stations ...	Experiment Stations, Washington, D. C.
Office of Public Roads	Roads, Agriculture, Washington, D. C.

To read --

States Relation Service	States Relations, Washington.
Office of Public Roads and Rural Engineering	Roads, Agriculture, Washington.

PAR. 75.

Add at end --

Provided, That reimbursement for the payment of any fee herein mentioned, will not be allowed in any State in which payment of such fee is prohibited by law. See Appendix "G".

PAR. 78 (b)

Add at beginning --

Except as provided in Paragraph 78 (v),

Add at end --

Where a receipt or check is not tendered on a cash payment for sleeping car or parlor car accommodations, request therefor should be made.

PAR. 78 (c)

Add at end --

Provided, That reimbursement for the payment of any fee herein mentioned will not be allowed in States in which the payment of such fee is prohibited by law. See Appendix "G".

PAR. 78 (f)

Rewritten as follows --

The checking of baggage at depots, hotels, or docks upon arrival and departure, not to exceed 10 cents for each piece; porterage not to exceed 25 cents at docks when customary, and not to exceed 10 cents for each piece in any other case may be allowed. Reimbursements for the payment of any fee herein mentioned will not be allowed in States in which the payment of such fees is prohibited by law. See Appendix "G".

PAR. 78 (h)

Change the following --

"laundry not exceeding $1.40 a week, fractional portions of a week to be prorated at the rate of 20 cents a day, and all other subsistence expenses."

To read --

"laundry not exceeding twenty cents a day, to be included in subsistence expenses for the date on which it is paid, and all other subsistence expenses."

Add at end of paragraph --

Provided, That reimbursement for the payment of any fee hereinmentioned will not be allowed in States in which the payment of such fee is prohibited by law. See Appendix "G".

PAR. 78 (j)

Add at beginning --

Except as provided in Paragraph 78 (v)

PAR. 78 (v)

A new paragraph --

Whenever, for any reason, actual expenses allowed under these regulations as incidental to travel, such as hotel accommodations, meals, sleeping berth, stateroom, special transportation, and the like, are incurred by an employee jointly with members of his family or other persons, the employee is entitled to reimbursement for one-half of the aggregate joint expense when accommodations are shared with one person, to one-third of such expense when accommodations are shared with two other persons, and to a similar proportion of such expense when accompanied by a larger number of persons. All joint expenses must be paid for in cash, and the account must clearly show the number of persons sharing in the joint expense.

PAR. 81.

Add the following --

"except as provided in Paragraph 78 (v)"
after the words " * * department business where the fare involved is $1 or more,"

PAR. 95.

Last sentence to be changed to read as follows --

"When it is necessary to appear before a notary or justice of the peace, owing to the impracticability of reaching the first or second named officials, fees as shown by the table of notarial and justice of the peace fees (See Appendix "E") will be allowed if not in excess of the legal rate authorized by the State laws at the time the services are rendered.

APPENDIX E. Is revised.

APPENDIX G. (New)

Payment of tips, fees, or gratuities to any steward, waiter, porter, or any other employee at any hotel, restaurant, cafe, eating house, or to any porter or other employee of any sleeping car company corporation, or carrier is prohibited by law in the States of Arkansas and Iowa.

Payment of tips, fees, or gratuities to any person in the employ of any hotel, restaurant, cafe, dining car, railroad company, or sleeping car company is prohibited by law in the States of Mississippi and South Carolina.

LIBRARY.

Miss Mabel Colcord, Librarian.

NEW BOOKS.

Canada. Conservation commission. Committee on forests. Forest protection in Canada. 1913-1914. Toronto. 317p. maps. By Charles Leavitt.

Citron, Julius and Garbot, A. L. Methods of diagnosis and therapy and their practical application. Philadelphia. 267p.

Dadant, C. P. Facts about honey. Keokuk, Iowa, 1916. 16p.

Swedish institute of experimental forestry. Publication no.12 i.e. Meddelanden fran Staten skogsforsoksanstalt haftet 12 1915.

Muller, Fritz. Werke, Briefe und Leben, gesammelt und herausgegeben von Dr. Alfred Moller. Gesammelte Schriften. v.1, pt. 1-2 and atlas. Jena, 1915.

Nawa Entomological Laboratory, Gifu, Japan. Bulletin no.1, Feb. 1916.

Pellett, F. C. Productive bee-keeping... Philadelphia, 1916. 302p. (Lippincott's farm manuals, ed. by K. C. Davis.)

Punnett, R. C. Mimicry in butterflies. Cambridge, At the University Press, 1915. 188p. 16 pl.

Riley, W. A. Notes on animal, parasites and parasitism- lecture outlines of a course in parasitology with special reference to forms of economic importance. Ithaca, 1912. 54p.

Sinclair, James. Instructions for collecting and preserving valuable Lepidoptera; copyright 1916, by James Sinclair. Los Angeles, Cal., 1916. 80p.

U. S.-War dept.- Adjutant general's office. Official army register for 1916. Dec. 1, 1915. 720p.

Watson, Malcolm. Rural sanitation in the tropics. London, 1915. 320p. illus.

Weed, C. M. and Ned. Dearborn. Birds in their relations to man. Philadelphia, 1916. Ed. 2 rev. 390p. plates. A partial bibliography of the economic relations of North American birds, p. 331-383.

BEE CULTURE.

E. F. Phillips, In Charge.

Dr. E. F. Phillips addressed the New York Farmers on April 4 at their annual dinner in New York City.

The Secretary for Agriculture and Industries of British Columbia has issued a regulation under date of March 23, 1916, requiring that all bees entering the province be accompanied by a certificate vouching for their freedom from infectious brood diseases.

Geo. E. Bemuth will leave soon for Winchester, Va., to resume the work on the effect on bees of spraying fruit trees, in cooperation with the Office of Deciduous Fruit Insect Investigations. The work will also probably be continued at a more northern point at a later date.

DECIDUOUS-FRUIT INSECT INVESTIGATIONS.
A. L. Quaintance, In Charge.

P. Isely, who has been in Washington preparing his notes on grape-insect investigations, has returned to the field for the purpose of resuming investigations of the grape-berry moth and other grape insects at North East, Pa.

H. G. Ingerson, who has been assisting Mr. Simanton at Benton Harbor, Mich., in connection with orchard-insecticide and spraying-machinery investigations, after spending some little time in Washington in the preparation of his field notes, has now returned to the field for the purpose of undertaking investigations of the grape-berry moth and other grape insects in northern Ohio.

B. R. Leach has returned to his permanent headquarters at Winchester, Va., where he will continue his investigations of the wooly apple aphis.

E. B. Blakeslee, who has been in Washington preparing notes on the subject of his field investigations, has returned to the field to resume his investigations of peach insects and will spend a good deal of his time this season in the neighborhood of Springfield, W. Va., investigating the peach-tree borer.

FOREST INSECT INVESTIGATIONS
A. D. Hopkins, In Charge.

A NEW PLANT-INSECT CAGE.

S. A. Rohwer has recently designed and had constructed a small cage to be used to confine, under natural conditions, growing plants.

This cage is a bronze wire cylinder, the top of which is closed by a lid which fits on like the lid of an ash can, the lower end is open and fits against the soil. The frame is made of galvanized iron. The top and bottom are bands two inches wide with the edges turned and are held apart by three strips of one inch by one-eighth inch galvanized iron which project six inches below the bottom of the cage so they can be driven into the ground to hold the cage in place. The uprights are soldered to the bands on the inside. The bronze wire is held in place by solder. The lid is a galvanized iron band over the top of which is bronze wire. The cage is eighteen inches high by fourteen inches in diameter. On one side is soldered a one and one-half inch screw top which affords an easy way of introducing insects after the cage is in place.

This cage is very useful in experiments on insects working on living plants as it is possible to grow, under nearly natural conditions, clean host plants and to infest them with known insects. At the Eastern Field Station it is known as the G type cage and is used in studies on insects of the Genus Evetria and its parasites. More information concerning its construction or cost may be had through correspondence.

SUGGESTIONS FOR OBSERVING AND RECORDING SEASONAL HISTORY EVENTS IN THE DEVELOPMENT OF BEETLES.

By A. D. Hopkins, Forest Entomologist.

[NOTE: This scheme for observing and recording seasonal history, was evolved and used by the branch of Forest Insect Investigations, with particular reference to Scolytoid beetles, but is applicable to seasonal-history studies of insects in general.]

If the observations begin with the overwintered broods, note the stages in which the insect passes the winter as (a) parent adults, (b) new adults, (c) matured larvae, (d) medium larvae and (e) young larvae.

First, locate trees or parts of trees with broods of approximate even ages in b, c, d, and e. Second, note the date of beginning of general activity as manifested in (a) by the first eggs deposited by the overwintered parent adults, in (c) by the feeding and development of the larvae and transformation to pupae and in (d) and (e), feeding and development.

Follow (a) and note how long the parent beetles live, when the last eggs are deposited, when the first eggs hatch, when the first pupae appears, when the first adult transforms, and first to last emergence.

Follow (b) and note the first, maximum and last emergence and so on for each generation.

Follow (c) and note the date of - 1, the first pupa, 2, the first adult, 3, the first emergence and 4, the last emergence of the adults.

Follow (d) and (e) in the same manner until the last overwintered examples of the overwintered broods have emerged.

Third, note the first attack by the overwintered brood adults (b) 1, on felled or dying trees, 2, on living, healthy trees, and follow the development of the first set of broods to completion and emergence.

Fourth, in 20 to thirty days after the first observed attack note attacks on 1, felled or dying, or 2, living, healthy trees and follow the development of the broods to completion. At the date of observation of attack, note whether or not adults from broods (c) have developed and emerged.

Fifth, in 20 to 30 days after the observed attack under the Fourth series, note attack on felled, dying or living trees and follow the broods to development and emergence. Note as in four, the condition of the overwintered broods when observations begin under this series.

Sixth, if in 20 to 30 days after the beginning of the fifth series of observations, the adults of the first generation under the third series have not begun to emerge, start another series of observations as in the fourth and fifth.

Seventh, as soon as general emergence is noted from the broods under the third series, begin another by noting trees attacked and follow the development and so on with successive series at intervals of 20 to 30 days until activity ceases in the autumn.

So far as possible, infested sections of bark of the host tree of the species under observation should be caged and as soon as the beetles begin to emerge, place fresh sections in the cage. This experiment should include representatives of the stage of the insects that predominate in the overwintered broods, as stages a, b, c, d, or e. So that the corresponding series of observations, or the development and

subsequent events of the same stage of broods in the open can be compared with the broods under control. By means of such a series of observations, the complex problem of the overlapping of broods and generations can be worked out.

The various events and periods to be determined are indicated in the accompanying extracts from a manuscript on seasonal history of D. brevicomis; while the periods, etc., can be made up largely from the notes at the end of the season, they should be kept in mind so that the notes will conform as near as possible to the requirements.

Phenological. While the phenological blanks can be used for checking the stages and developments, they are intended to supplement the regular notes in connection with the seasonal history work. But one sheet or series of sheets should be used for each of the specific series of observations, as for broods - a, and b, and c, and d, and e. Also for the third, fourth, fifth, and sixth and other series through the season.

In addition to this, it is important to supplement the phenological notes with brief to full notes in the field diary, during and at the close of each day on which observations are made.

It is of special importance to concentrate all thoughts and attention to the recording of the facts as observed and above all to guard against the formation of hasty conclusions, preconceived ideas, assumptions, theories, or generalizations, before or during the observations. These should be left until the end of the first or second season and based on accumulated data. In other words, let the motto be -

First, avoid preconceived ideas, opinions and assumptions.
Second, Concentrate thought, observations and energies on noting the observed facts, and evidences and collect specimens to support them.
Third, When in doubt as to species, methods or instructions, send specimens to, and ask questions of the best authorities on the subject. (our specialists).
Fourth, Study the accumulated data and verify doubtful points.
Fifth, In a year or two after the first observations are made, begin to form conclusions slowly.
Sixth, Generalize only on data from all available sources.

While the above applies to seasonal history of Scolytoids, it also applies in general to many other insects. Each species will require certain modifications to conform with the slight to great variation in and overlapping of broods and generations annually.

For example, in D. monticolae there is a great variation in the overwintered broods and the development of the broods during the season but there is little or no overlapping of generations except at the higher altitudes of its distribution (Yosemite National Park, above 7000 feet). Where it may require two or three years for the completion of a generation period from the first egg to the last adult, possibly at the lower southern altitudes of its distribution, there may be a partial second generation but at the average altitude and latitude, it is fairly safe to conclude there is but one generation annually.

In the genus Scolytus and especially in the hickory barkbeetle, there is considerable variation and overlapping of the broods, but there is apparently no overlapping of generations except at the lower altitudes towards its southern limits.

In Ips there is a short generation period and consequently a great overlapping of broods and generations.

Phenological observations - In making phenological observations in connection

with seasonal history work, the records on the phenological blanks should be restricted to consecutive observations on broods of even stages of development.

The records on **parent adults** relate to the activities of overwintered individuals from which the subsequent events are checked on the same sheet.

The first eggs, larvae, pupae, adults, and emergence relate to the date on which the first were observed in a given series of even aged broods. **Maximum** is when the stage appears to be most common, and the last refers to the very last observed. This as well as maximum may require a number of checks but the last check in continued records will give the latest date. It is often necessary to make a brief explanatory note following the check to include a more detailed note on the back of the sheet under date of the observation, indicating such notes by a number following the check.

Under attack - the **first, maximum**, and **last** attacks relates to the attack on an individual tree or part of a tree on which continued observations are to be made. A note on the back of the sheet, in the diary or on a numbered card corresponding with the numbered tree should give more detailed information about the condition of the tree when attacked and the concentrated or scattered character of the attack. Then sections of the trunk or bark with a preponderance of even date attacks should be utilized for consecutive observations, utilizing certain parts for consecutive observations in which small sections of the bark may be removed by means of a chisel and later replaced and secured with a nail to prevent, as far as possible, the drying out of adjacent bark. Other sections should be left undisturbed for emergence records, and still other sections to be removed at longer intervals.

In addition, sections of trees should be caged for generation studies, placing fresh sections in the cage as soon as the final emergence of brood adults is noted.

There are many other features, methods and devices which will suggest themselves as the studies progress.

In the earlier work specimens and memoranda should be sent in to the Washington office at frequent intervals on matters of special interest and those on which comments or advice is desired.

The phenological records on plants kept in connection with those on insects, will serve as a general basis for the comparison of events, but special notes should be made on certain species of trees which appear to serve as an index to the time of beginning of, and general emergence, and the beginning of, and general attack of the different stages of overwintered broods which are the events of primary importance in connection with control work.

The following table of days for a normal year has been very useful in computing differences in dates of events in insect and plant activities and especially in seasonal history studies.

TABLE OF DAYS FOR A NORMAL YEAR.

Ja	Fb	Mr	Ap	My	Jn	Jl	Ag	Sp	Oc	Nv	Dc
1	32	60	91	121	152	182	213	244	274	305	335
2	33	61	92	122	153	183	214	245	275	306	336
3	34	62	93	123	154	184	215	246	276	307	337
4	35	63	94	124	155	185	216	247	277	308	338
5	36	64	95	125	156	186	217	248	278	309	339
6	37	65	96	126	157	187	218	249	279	310	340
7	38	66	97	127	158	188	219	250	280	311	341
8	39	67	98	128	159	189	220	251	281	312	342
9	40	68	99	129	160	190	221	252	282	313	343
10	41	69	100	130	161	191	222	253	283	314	344
11	42	70	101	131	162	192	223	254	284	315	345
12	43	71	102	132	163	193	224	255	285	316	346
13	44	72	103	133	164	194	225	256	286	317	347
14	45	73	104	134	165	195	226	257	287	318	348
15	46	74	105	135	166	196	227	258	288	319	349
16	47	75	106	136	167	197	228	259	289	320	350
17	48	76	107	137	168	198	229	260	290	321	351
18	49	77	108	138	169	199	230	261	291	322	352
19	50	78	109	139	170	200	231	262	292	323	353
20	51	79	110	140	171	201	232	263	293	324	354
21	52	80	111	141	172	202	233	264	294	325	355
22	53	81	112	142	173	203	234	265	295	326	356
23	54	82	113	143	174	204	235	266	296	327	357
24	55	83	114	144	175	205	236	267	297	328	358
25	56	84	115	145	176	206	237	268	298	329	359
26	57	85	116	146	177	207	238	269	299	330	360
27	58	86	117	147	178	208	239	270	300	331	361
28	59	87	118	148	179	209	240	271	301	332	362
29	*	88	119	149	180	210	241	272	302	333	363
30		89	120	150	181	211	242	273	303	334	364
31		90		151		212	243		304		365

* In Leap Year add 1 to each number beginning with March 1.

SOUTHERN FIELD CROP INSECT INVESTIGATIONS
W. D. Hunter, In Charge.

The field station at Batesburg, S. C., which has been in operation for several years has been discontinued. E. A. McGregor who was in charge has been detailed to work on cotton insects in the Imperial Valley of California. F. L. McDonough is now stationed at Quincy, Fla., on work with tobacco insects.

D. L. Van Dine has gone to Mound, La., to resume his work on malaria mosquitoes.

W. V. King is now at Florence, Montana, where he will have charge of the Bureau's work on the eradication of the spotted fever tick. He will return to Louisiana sometime during the summer.

FEDERAL HORTICULTURAL BOARD.
C. L. Marlatt, Chairman.
(In Cooperation with the Bureau of Entomology.)

The Federal Horticultural Board has very intimate cooperative relations with the Bureau of Entomology. The Chairman and one of the members of the Board are also officers of the Bureau. The entomological inspectors of the Board force are entomologists in several instances transferred from the Bureau. The more important domestic quarantines (the moth quarantine and the Mediterranean fruit-fly quarantine) are administered by the Board in cooperation with the Bureau of Entomology and at the cost of Bureau appropriations. All the other insect quarantines have also a cooperative relation with the Bureau. Much of the work, therefore, of the Federal Horticultural Board is of direct interest to the members of the Bureau force. Some items of Board work have been recorded in these Monthly Letters from time to time in the past. Hereafter such items will be given under the title "Federal Horticultural Board."

The activities of the Board are recorded in a monthly bulletin of the Service and Regulatory Announcements series of the Department. Any member of the Bureau force desiring to receive this publication regularly can be put on the mailing list of the Board upon application.

The Federal Horticultural Board consists of five members, of whom not more than two may be appointed from any one bureau or office of the Department. The Board as now designated by the Secretary of Agriculture is as follows: C. L. Marlatt, Chairman; W. A. Orton, George B. Sudworth, W. D. Hunter, and Karl F. Kellerman. The entomological inspectors of the Board are: E. R. Sasscer, E. L. Sanford, and Harold Morrison. The pathological inspectors of the Board are: R. Kent Beattie, George R. Lyman, and J. T. Rogers. The cotton inspection service at the present time includes: A. I. Smith, A. G. Webb, J. S. P. Carpenter, and H. H. Willis. Harry B. Shaw is the general inspector for New York City, and Frederick Maskew for San Francisco. A. J. Mitchell is engaged in the control of the two date-palm scale insects covered by the domestic date palm quarantine. In addition, the Board has appointed as collaborators some seventy State inspection officials. R. C. Altheuse is in charge of the administrative office, and Jos. H. Batt is in charge of cotton importations.

A quarantine item of peculiar interest developed during this month, namely, the discovery that the prize steamer Agram, brought into Hampton Roads early this year, contained as a part of its cargo some two hundred tons (3,755 bags) of cotton seed from Lagos, West Africa. This region in West Africa is infested with the pink boll worm, and is probably the place of origin of this pest. The presence of this seed

developed from a court order authorizing the sale of all the perishable portion of the Appam's cargo. As soon as the existence of this seed was known, immediate steps were taken to safeguard the situation by the destruction of the seed. The distribution of the seed as a result of the sale was stopped by telegraph, and Messrs. Marlatt and Hunter of the Board, accompanied by two cotton experts from the Office of Markets and Rural Organization of the Department, Messrs. Poe and Barghausen, together with Mr. Morrison, an inspector of the Board, proceeded immediately to Newport News to take charge of the situation. After strenuous work of a couple of days, which occupied the attention of all five persons named, covering negotiations with Richmond, Norfolk, Newport News and Portsmouth, arrangements were made for the conversion of this entire lot of cotton seed into fertilizer in the plant of the Virginia-Carolina Chemical Company at Portsmouth. The dock on which the seed had been unloaded with a vast quantity of other cargoes from the ship has been thoroughly cleaned up, and the ship itself will be given cyanide fumigation.

An examination of this seed showed an infestation of one or two per cent with the pink bollworm. Most of the infested seeds, however, had been abandoned by the insect, which may or may not have a sinister interpretation. Living larvae of the pink bollworm were also found. It is to be hoped that the insects which have escaped either perished in the long trip from Africa or perished during the winter in the rather broad waters of the mouth of the James River and Hampton Roads. Fortunately, there is no cotton grown immediately in the vicinity of the ship, although within ten or fifteen miles there is considerable cotton. This importation was, naturally, most unexpected and presented a degree of danger which no other importation of cotton has brought to this country. The situation was also very much complicated by legal complexities bearing on ownership, involving negotiations with the Federal Courts at Richmond and with the legal advisors of the rival claimants at Norfolk. It is pleasant to report that all of the various interests, including also the Virginia-Carolina Chemical Company which undertook its share of the work entirely for the public good, united in the heartiest cooperation in the effort to have the seed promptly destroyed and thus safeguard from further risk. A thorough inspection will be made of all cotton growing in that part of Virginia next summer as an additional precaution. The transfer of this cotton from the dock where it was lying to the fertilizer company was accomplished in one afternoon by lighterage by the active aid of some eighty laborers who were drafted for the purpose.

TRUCK CROP AND STORED PRODUCT INSECT INVESTIGATIONS

F. H. Chittenden, In Charge.

A new and important project for the coming year will be an investigation in cooperation with the Bureau of Plant Industry of insects as carriers of mosaic and other diseases of cucumbers and other cucurbits with special reference to the pickle industry of the States of Wisconsin, Michigan, and Indiana. The principal insects which act as disseminators of these diseases are the striped and twelve-spotted cucumber beetles and the tarnished plant-bug, while other insects are under suspicion.

N. F. Howard, who was engaged during the past summer in work on the root-maggots and other insects injurious to onion and cruciferous crops at Green Bay, Wis., and who has been studying for a Master's and Doctor's degree at the Ohio State University, has been engaged to continue the work begun at that station, and also to investigate insects as carriers of pickle diseases.

B. L. Boyden, who has been engaged in experimental work on the sugar-beet wireworms and other insects injurious to sugar beet, beans, and other truck crops at Oxnard, Cal., has taken permanent headquarters at Pasadena, Cal., the Oxnard station remaining as a substation.

R. B. Ellis, who has studied entomology at the Agricultural College at Manhattan, Kans., has been engaged to assist in work on insects injurious to sugar beets and truck crops at Wichita, Kans., where F. B. Milliken is in charge of the local station.

J. G. Hester, who assisted M. M. High in his work on onion insects and truck-crop pests last year, has been reappointed and will resume work at Brownsville, Texas and vicinity.

Charles E. Smith, who has had experience in investigation of insects injurious to truck crops at Baton Rouge, La., has been reappointed to assist Thomas H. Jones, at the Baton Rouge Station.

The broad-bean weevil (Laria rufimana Boh.) considered in detail in Bulletin 96, Part V, has recently been ascertained to have a positive alternate food plant in the garden pea. Numerous specimens were obtained in peas from Paris, France, during the past month. Thus far we have not received notice of this insect occurring in peas on the Pacific Coast and agents of the Bureau and correspondents in California are urgently requested to keep a lookout for it. The discovery of this new food plant will probably render it impossible to stamp out the pest in the few regions where broad or Windsor beans are grown, and which it is now known to infest.

The fig moth (Ephestia cautella Walk.) has been reported to this Bureau by M. M. High as occurring in new material. Moths have been reared from Kafir corn and cowpeas, and also in alfalfa meal. This species has been treated in detail in Bulletin 104, a list of food plants being given on page 19. It is one of the several species of insects which have been found injuring cork in the heads of pop bottles. We have also received specimens through the Federal Horticultural Board occurring in yeheb nuts from Arabia.

Information has been received from M. M. High, Brownsville, Tex., and from Prof. F. W. Mally, County Agent, Laredo, Tex., that a considerable acreage of onions and garlic have been saved from the ravages of the onion thrips by the control measures advised by this Bureau at Mission, Mercedes, Harlingen, Laredo and Brownsville.

Harold L. Weatherby of Alabama has been appointed field assistant for work at Rocky Ford, Colo., where he was employed a few years ago.

C. Joseph Manter of California has been appointed field assistant for work in that State on sugar-beet and truck-crop insects.